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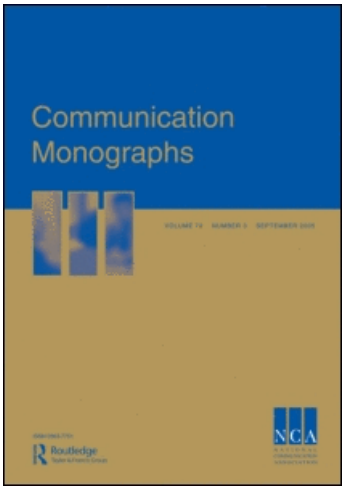

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The Attentional Mechanism of Message Sensation Value: Interaction between Message Sensation Value and Argument Quality on Message Effectiveness

Yahui Kang, Joseph Cappella & Martin Fishbein

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Using a secondary data analysis on adolescents' evaluations of 60 antimarijuana public service announcements, this study examined the role of message sensation value (MSV) as an attention distractor. The results supported the prediction based on the Elaboration Likelihood Model that MSV might be a distractor of attention to reduce ad persuasiveness when the argument quality was high and to facilitate ad persuasiveness when the argument quality was low. Furthermore, this interaction was evident only for adolescents with greater risk for marijuana use, suggesting that high MSV messages were especially distracting for the high risk adolescents. Specific MSV subcomponents contributing to this interaction were explored. Possible explanations for the interaction effect as well as implications for antidrug ad design were discussed.

Keywords: Message Sensation Value; Antimarijuana Public Service Announcements; Message Effectiveness

The effectiveness of persuasive messages has been studied in terms of content and format. While content and format are often melded in a single message and while it is not always obvious which message features are format and which are content, the distinction is heuristically useful. In general terms, content refers to the topic, theme,

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story, or argument the message presents, whereas format refers to the way in which the argument, theme, topic, or story is presented. Some define content as the semantic elements of the message presented through textual, visual, and audio modalities, while format is seen as the syntactic structure of these semantic elements (Messaris, 1997).

Research into persuasion has studied both content and format and sometimes their interaction. Studies on argument quality, message sidedness, and types of normative appeals focus on message content and its effects on attention, reception, acceptance, and yielding. Studies on certain message features including edits, cuts, and visual images focus more on message format by considering how the same information or argument can be presented or structured in different ways in order to influence people's processing of the message.

The current study continues this tradition in the context of public service announcements (PSAs)—particularly those directed at adolescents and their possible use of drugs. By identifying two message features—argument quality and message sensation value (MSV)—as content and format respectively, this study examines the interaction between content and format on audience's message evaluation. Two theoretical models are used to propose alternative interaction patterns between argument quality and MSV—the Elaboration Likelihood Model (Petty & Cacioppo, 1986) and the Activation Model of Information Exposure (Donohew, Finn, & Christ, 1988; Donohew, Lorch, & Palmgreen, 1998; Zuckerman, 1979). The theories offer competing predictions about the consequences of MSV and argument quality on perceptions of message effectiveness, based on different assumptions about the attentional mechanism of MSV. The test of the competing theories also serves as a check for the construct validity of MSV (and its subcomponents) as an elicitor of attention. Subgroups of adolescents differing in risk for drug use are also examined to see whether the two message features (argument quality and MSV) affect message reception differently for different adolescent populations. This test provides additional evidence for the attentional mechanism and hence the construct validity of MSV.

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Argument Quality as a Feature of Message Content

Argument quality as a feature of message content has been widely used in the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1986). ELM is a cognitive model that attempts to explain information processing in a number of areas including psychology, communication, consumer marketing, and linguistic research (Ajzen, 1987; Areni, 2003; Pratkanis, 1989; Sears, 1988). The underlying assumption of ELM is that people are motivated to hold correct opinions but also are cognitive misers. To achieve these goals, people may take two alternative routes to message processing: central and peripheral. When one's ability and motivation to process the message are both strong, one will take a central route to processing. During this process, argument quality is important in determining the final outcome of persuasion. A strong argument (a well-constructed and convincing message to which

the receiver is more likely to respond favorably) will be more persuasive than a weak argument. Central processing is deeper processing and allows new information to be integrated with one's previous beliefs. Therefore, central processing will lead to stronger influence and easier retrieval of the message in the future. However, central processing is more effortful. When people are less capable or willing to conduct elaborative processing or are distracted (Petty, Wells, & Brock, 1976), they will look for cognitive shortcuts or peripheral cues, which allow them to make quick judgments based on superficial aspects of the message. During this process, peripheral cues rather than argument quality become more influential on message reception. Typical candidates for peripheral cues include source credibility and message formatting features such as high quality production, which have little to do with the content of the message. Audiences using a peripheral route to persuasion are more likely to agree with the message when the source is credible and the message has high quality production features, regardless of the strength of the argument.

Argument quality represents a content feature that is more likely to have an influence on persuasive outcome during central processing. Strong arguments should be more effective than weak arguments only when one is motivated to process the message and has devoted his or her cognitive attention and resources to processing the content of the message (or the central argument). Strong arguments, however, may not be more effective than weak arguments if one does not pay attention to the content but focuses on the format of the message. Prior studies have repeatedly shown that when one's attention is diverted from central argument content, one is more likely to be persuaded by peripheral features than by the quality of the argument (Petty & Cacioppo, 1984, 1986).

According to the ELM, one's motivation and ability to process the message are the key predictors of one's attentional focus. Some message format features may attract people's attention without their conscious self-control and willingness. This process may deplete one's cognitive resources to process the message content. For example, when attention to the message is not forced, the vivid elements in a message (e.g., picturesque examples) tend to attract automatic attention, which may interfere with reception of the central message and reduce message memorability and persuasiveness (Edell & Staelin, 1983; Frey & Eagly, 1993). In such a situation, one is less likely to rely on the quality of the argument to make the judgment, not because of low involvement or motivation, but because of lack of cognitive ability.

Distraction can be one reason for lack of cognitive ability. Petty et al. (1976) have conducted two experiments to demonstrate the impact of distraction on message acceptance (measured as attitude and thought listing). They have found that increasing distraction enhances persuasion for a weak argument but reduces persuasion for a strong argument. They argue that the major function of distraction is to disrupt one's dominant thought during message processing. Because weak arguments tend to elicit predominantly negative thoughts, whereas strong arguments elicit predominantly positive thoughts, the distraction will disrupt or reduce one's negative thoughts about weak arguments and positive thoughts about strong arguments. Petty and colleagues manipulate arguments in terms of logical soundness

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and their ability to elicit counterarguments. Although these arguments have been labeled as ones that are easy and difficult to counterargue, they are conceptually the same as strong and weak arguments. The study by Petty et al. replicates an earlier study that has found that distraction enhances persuasion for short, easily understood, but unconvincing messages, but decreases persuasion for long, difficult to understand, but convincing messages (Regan & Cheng, 1973). Later studies further support the "dominant thought disruption" hypothesis by showing that distraction reduces counterargument when a counterattitudinal message is presented but decreases favorable thoughts when a proattitudinal message is presented (Eisenstadt, Leippe, Rivers, & Stambush, 2003; Harkins & Petty, 1981; Lammers & Becker, 1980).

Although most distraction studies create external distractions (e.g., via secondary tasks such as monitoring an "X" that flashes periodically on the screen), distraction may also come from the message itself. Some message format features (e.g., vivid elements of a message) can attract people's attention and contribute to a similar distraction effect. The current study tests this possibility with a set of message format features called message sensation value (MSV).

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Message Sensation Value as a Feature of Message Format

MSV describes a set of message features which can function independently and in combination to attract attention. The MSV concept has been applied primarily to messages directed toward adolescents. The features are derived from theoretical underpinnings in sensation seeking personality (Zuckerman, 1979; Zuckerman & Kuhlman, 2000) and are presumed to elicit sensory, affective, and arousal responses (Everett & Palmgreen, 1995; Harrington et al., 2003; Palmgreen et al., 1991). These structural features include formal video features (e.g., cuts, edits, special visual effects, etc.), formal audio features (e.g., sound effects, music, voiceover, etc.), and content format features (e.g., act out vs. talking head, surprise/twist ending, etc.) (Morgan, Palmgreen, Stephenson, Hoyle, & Lorch, 2003). Although some researchers may consider the last category of features as content rather than format, the original authors of the MSV index suggest that these "content" variables "do not have to do with specific consequences or arguments, but are more concerned with how these more specific features are arranged (e.g., surprise/twist ending) or portrayed (e.g., acted out versus talking head, use of a narrative structure)" (Morgan et al., 2003, p. 523). Hence all MSV features are considered here to be format features.

If MSV functions as it should theoretically, then messages high in MSV should elicit an audience's arousal, attention, and affective responses. Empirical studies have generally supported the impact of certain MSV features (e.g., fast-paced editing) on arousal using both psychophysiological measures such as heart rate and skin conductance (Detenber, Simons, & Reiss, 2000; Lang, 1990; Lang, Bolls, Potter, & Kawahara, 1999; Lang, Dhillon, & Dong, 1995; Lang, Geiger, Strickwerda, & Sumner, 1993; Lombard, Reich, Grabe, Bracken, & Ditton, 2000) and self-reported measures (Everett & Palmgreen, 1995; Stephenson & Palmgreen, 2001).

The impact of MSV on affective reactions is less thoroughly studied, but several studies have shown that high sensation seekers prefer messages that are perceived to be high rather than low in MSV. Low sensation seekers tend to respond to high and low MSV messages in a similar fashion (Donohew, Lorch, & Palmgreen, 1991; Lorch et al., 1994; Morgan et al., 2003). These results on preference may be taken as evidence that high sensation seekers tend to give more positive evaluations of high MSV ads.

However, higher arousal and liking elicited by a particular style of messages do not necessarily entail paying more attention or putting more mental effort into processing the message (Yoon, Bolls, & Muehling, 1999). Currently, the link between MSV and attention seems unclear. In most studies involving message evaluation, attention is forced, and, hence, assumed. When a naturalistic environment is used and people are given alternative options to TV viewing, including reading magazines, newspapers, and short stories, perceived MSV (PMSV) of television programs is shown to drive attention, such that high sensation seekers attend more to high MSV than low MSV programs, whereas low sensation seekers do not show differences in attention to two types of programs (Lorch et al., 1994). This level of attention seems to be retained and transferred to ads embedded in the program regardless of the sensation value of the ads. Although this study suggests a link between PMSV and attention, PMSV is distinguished from MSV (Morgan et al., 2003). As a measure of one's cognitive assessment of MSV, when PMSV is measured at the same time as attention, it is not clear whether PMSV is a causal predictor of attention or a post hoc justification of one's program selection. MSV, on the other hand, is a pure message feature. The link between MSV and attention can provide clearer evidence to support MSV as an elicitor of attention.

Some individual features of MSV, such as edits, cuts (Basil, 1994; Geiger & Reeves, 1993; Niederdeppe, 2005), visual graphics (Thorson & Lang, 1992), pace (Bolls, Muehling, & Yoon, 2003; Yoon et al., 1999), and emotionally intensive messages (Hitchon & Thorson, 1995; Lang, Newhagen, & Reeves, 1996) have shown some impact on attention, arousal, memory, and cognitive capacity (Lang, 1990). However, evidence about the impact of MSV as a composite feature on attention and message processing is limited. Grouping a set of structural features under the concept of MSV may or may not produce the same effects, in the same strength or in the same direction.

In sum, despite its intuitive appeal and conceptual soundness, research is still unclear about the mechanism through which MSV affects attention. In our study, we compare high and low MSV messages to assess their effects on attention and thereby provide additional information on the construct validity of this measure. Moreover, the attentional mechanism of MSV is especially important to message designers and communication scholars, as (following McGuire, 1989) attention constitutes the first step after message exposure, and may lead to deeper message processing and even persuasive outcome. However, prior studies have not directly tested the attentional mechanism of MSV. As some scholars have pointed out, "there is a great need for

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theory that explicates the process underlying the relationship between message characteristics and message effectiveness" (Morgan et al., 2003, p. 523).

Attentional Mechanism of MSV

Two theoretical models may help us understand the attentional mechanism of MSV. One is the Activation Model of Information Exposure (AMIE; Donohew et al., 1988, 1998; Zuckerman, 1979) and the other is the ELM. AMIE posits that one's level of need for sensation is a fundamental component determining the likelihood that certain messages will attract and hold attention of any given individual. Messages with a sensation value that matches the level of the audience's need for sensation will result in positive affect and lead to continued exposure to the message. The model suggests that messages with a sensation value that is higher or lower than this optimal level will lead one to seek less or more arousing messages to meet his or her need for sensation.

AMIE argues for an attention-catching effect for MSV features. It suggests that high MSV ads can attract more attention to the ads and lead to a more in-depth processing of the arguments embedded in the ads. In this condition, stronger arguments will be more effective than weaker arguments. Low MSV ads do not attract enough attention toward the ads, and therefore people may not process the central argument of the ads as deeply. Weak arguments may benefit from low MSV because people's counterarguments against weaker arguments may be reduced due to the lack of attention and in-depth processing. Strong arguments, however, may be negatively affected by low MSV, because people may not generate as many supportive thoughts due to lack of attention. As a result, weak arguments may be equally or even more effective than strong arguments. Thus, Hypothesis 1 states:

> H1: MSV interacts with argument quality on ad effectiveness, such that strong arguments are more effective than weak arguments for high MSV ads, whereas weak arguments are equally or more effective than strong arguments for low MSV ads.

Underlying the AMIE prediction, MSV is assumed to attract attention to messages in their entirety, including content (i.e., central argument) and format features (i.e., MSV). However, the same argument can be presented using a more arousing and fast-paced format or a slow-down single shot testimonial. The same visual features can also be used to present either a strong or a weak argument. Thus, MSV features are unrelated to the argument quality of the message. Processing of MSV features may be separate from processing of central arguments. When MSV attracts attention, it may only attract attention toward these formal features of the ad. Due to the limited capacity of cognitive processes (Kerr, 1973; Lang, 2000), cognitive ability to process the central argument or the content will be reduced.

The ELM allows for this possible separation between MSV and the central argument. By introducing the distinction between peripheral cues and central arguments, the ELM suggests that one's attention and cognitive resources may be

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directed toward either or both aspect(s) of the message, resources permitting. Because MSV is conceptualized to be audiovisual and format features that are capable of attracting attention and of eliciting sensory and affective responses from the audience, high MSV messages loaded with more of these features should command more attention and cognitive resources than low MSV messages, and hence disrupt one's cognitive ability to process the central argument. In accord with the thought disruption account (Petty et al., 1976), when the central argument is weak, this distraction will decrease negative thoughts or counterarguments and lead to a more favorable evaluation of the message; when the central argument is strong, this distraction will reduce positive thoughts generated by the message and result in a less favorable ad evaluation. Thus, high MSV may work as a distractor to close or even reverse the persuasion gap between strong and weak arguments. With low MSV messages, less demand is placed on cognitive resources by MSV features. Ample resource is left for the central argument. This will lead to a fair evaluation of the message: strong arguments viewed as more effective (with more supportive thoughts) than weak arguments. Thus, the following interaction effect is suggested:

H2: MSV interacts with argument quality on ad effectiveness, such that strong arguments are more effective than weak arguments for low MSV ads, whereas weak arguments are equally or more effective than strong arguments for high MSV ads.

The test of these two alternative interaction hypotheses not only tests the ability of MSV to attract attention to the message, but also tests the impact of focus of attention (MSV or argument quality). To further find out which components of MSV features drive the overall interaction between MSV and argument quality on message evaluation, four subcomponents of MSV identified by prior studies, including audio, visual, emotional, and content features (Morgan et al., 2003), are tested separately. Because no prior study has discussed the comparative impact of these subcomponents, only a research question is asked.

RQ1: Which component(s) of MSV features contribute to the overall interaction between MSV and argument quality on ad effectiveness?

Individual Differences in Message Processing

The above hypotheses and research question are raised from a message perspective, focusing on understanding the mechanism through which message features (MSV and argument quality) may interact with each other to affect message effectiveness. However, it is also important to consider individual differences among audience members. Both AMIE and ELM suggest that high MSV messages should only attract and sustain attention from people who are involved with the topic. People who are not involved with the topic may not pay enough attention to the message even if it contains an appropriate level of MSV. People who are involved with the topic may also be more knowledgeable about the issue to be able to differentiate between strong and weak arguments.

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The current study is conducted on antimarijuana PSAs. Prior research shows that adolescents' risk of marijuana use relates to age, sensation seeking tendency, and immediate social network, including the number of friends who use marijuana and the number of times marijuana is offered (Cappella, Yzer, & Fishbein, 2003). Adolescents with high level of risk of marijuana use tend to have a higher involvement with the topic and more knowledge about marijuana use than low risk adolescents. They may therefore have a higher motivation to process the antimarijuana messages and hence pay more attention to the message. The high risk adolescents are also those with stronger sensation seeking tendency. They tend to be more attracted to messages with higher sensation value (Donohew et al., 1991; Lorch et al., 1994; Morgan et al., 2003). Hence, their attention to the message content or the central argument is more likely to be either enhanced (according to AMIE) or distracted (according to ELM) by high MSV messages. The low risk adolescents, on the other hand, may not be as attracted to those messages as the high risk adolescents, and hence be less affected by high MSV. So for both models, the interaction effect should be more evident among the high risk adolescents.

H3: The interaction effect proposed in H1 or H2 is more likely to occur among high risk than low risk adolescents.

Method

A secondary data analysis was conducted on adolescents' evaluations of 60 antimarijuana PSAs. These ads are part of an antidrug PSA archive, which contains extensive ad evaluations from adolescents. This archive was created by researchers at the Annenberg School for Communication at the University of Pennsylvania through funding by the National Institute on Drug Abuse. The ads were evaluated in various ways over a six-year period to allow their selection in subsequent experimental tests. Three sources of data about the ads were employed in this study. The first source provided data on perceived ad effectiveness and ad liking as well as positive and negative thoughts about the ad. The second source provided information on the strength of the arguments used in the ads. A third source of data was the ads' MSV coded by trained coders. All these data were collected in separate studies prior to this secondary analysis. Details about the measures and sample population used in each of these original studies are described below. It is important to recognize that the evaluations of argument strength are provided by a sample of adolescent respondents different from the sample that rated the perceived effectiveness of the ads. MSV is coded using the specific objective codes, rather than being rated from the viewers' perspective, as is the case for the measure of PMSV. Unlike some ad evaluation studies, this study poses and answers its questions at the level of the ad.

Individual respondents also provided information on their age, the number of friends around them who used marijuana, the number of times they were offered marijuana, and their tendency to seek sensational experience. A measure of risk of marijuana use for each adolescent was calculated based on these four measures. This

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risk measure has been found to be valid and reliable in a previous study (Cappella et al., 2003). Adolescents were categorized as having either high or low risk based on a median split on this variable. The aggregate ratings for each ad were also calculated separately for the high and low risk adolescents. Thus, the data contained aggregate-level ratings for each ad for all adolescents as a whole as well as for high and low risk adolescents.

Samples

Perceived ad effectiveness. The sample aged 12–18 ($M = 15.30$) included approximately equal numbers of males (301) and females (300), and was predominantly Caucasian (432 Caucasians, 142 African Americans, 27 other race/ethnicity). Participants were recruited from shopping malls in urban locations throughout the US, including San Diego, Atlanta, Detroit, and New York, by Opinion One, a market research firm. Signed parental consent and youth assent forms were obtained prior to participation. Respondents were paid $10 in cash as compensation for their time.

Argument strength. The sample included 322 adolescents, 49.7% of whom were male. About two thirds (66.8%) of the sample were Caucasians, 22.4% African Americans, and 10.8% from other ethnic or racial groups. Age ranged from 12 to 18, with a mean of 15.4 ($SD = 1.95$). Respondents were recruited through mall intercept solicitations at 15 locations across the country, including Oakland, St. Louis, Cincinnati, San Antonio, Charlotte, Washington DC, and Kansas City. Signed parental consent and youth assent forms were obtained prior to participation. Respondents were paid $5 each for their participation.

Measures

Coders were trained to code MSV features using a slightly revised version of the coding scheme developed by Morgan et al. (2003). The only new feature added to the original MSV scale was the number of faces shown in the PSAs. A previous study has shown that appearance of faces increases person-focus of the message, which in turn increases attention toward the message (Southwell, 2002, 2005).[1] In the current study, the correlation between the coding of the number of faces and the original MSV scale was .13, $p > .30$; the correlation between the modified MSV scale and the original MSV scale without faces was .98, $p < .001$. We also introduced a distinction between implicit and explicit intense moments in our coding to account for situations where the intense moments were implied rather than shown explicitly on the screen. This distinction was introduced only to improve reliability among coders. Intense moments were then summed across implicit and explicit. Intercoder reliability of the MSV coding was acceptable (kappa = .79). The MSV total score was calculated as the sum of all individual MSV features ($M = 5.63$, $SD = 2.55$). Subcomponent scores were calculated as the sum of corresponding features. Specifically, the Visual subscale contained cuts, edits, special effects, fast movement, slow movement, and unusual color. The Audio subscale was the sum of music, sound special effect, and sound saturation. The Intense Image subscale was calculated as the sum of explicit exciting moment, implicit exciting moment, explicit disturbing moment, and implicit

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disturbing moment. This measure was skewed, as 50 out of 60 ads belonged to the no-intense-image category. The Content subscale was calculated as the sum of act out versus talking head, surprise ending, unexpected format, and the number of faces in the PSA presentation, as all of these features are concerned more with the content format of the message. In addition to four subscales of MSV, a Format subscale was calculated as the sum of Visual, Audio and Intense Images, in parallel to the Content subscale. While the Content subscale was more about the presentational style of the central argument or storyline of the PSAs, the Format subscale was more about the audiovisual features and less related to the central arguments or storyline. Except for variables noted otherwise, the remaining MSV subcomponents had a relatively normal distribution. The correlations between MSV total, Visual, Audio, Intense Images, Content, and Format are presented in Table 1. Format was highly correlated with MSV total score, suggesting that Format carried most of the variance in MSV. Visual was highly correlated with Format. Intense Images and Content were less related to the other subcomponents as well as to the total MSV score.

Argument quality is conceptualized as the strength of the argument presented in the PSA. One persuasive message per ad was extracted by experts using both the verbal claims and visual arguments presented by the ads. If an ad had multiple arguments, one coherent verbal message was created that included all the arguments made in the ad. Adolescents evaluated the extent to which each argument was convincing, strong, believable, important, made them feel confident to say no to marijuana, kept them away from using marijuana, elicited agreement from them, and put thoughts in their mind about staying away from marijuana. Each of these judgments was measured on a 5-point agreement–disagreement scale. The mean of these items was used to indicate argument quality ($M = 3.70$, $SD = 0.15$, Cronbach's $\alpha = .90$). A description of the argument evaluation process and the scale reliability and validity is presented in Zhao, Cappella, Fishbein, and Barrett (2005).

Three measures of ad effectiveness were used: perceived ad effectiveness, ad liking, and the predominant valence of thoughts generated by the ad. The separation of these three measures facilitates the interpretation of the interaction effect. It is important to recognize that these ad effectiveness evaluations may or may not relate to the actual ad effect (i.e., change in drug use behaviors). However, ad effectiveness judgment is often a necessary (although not sufficient) condition for producing actual change in

Table 1 Correlations between MSV Total, Visual, Audio, Intense Images, Content and Format Component of MSV ($N = 60$)

	2	3	4	5	6
1. MSV total	.94***	.85***	.47***	.66***	.50***
2. Format		.90***	.53***	.67***	.48***
3. Visual			.34**	.34**	.40***
4. Intense image				.26*	.29*
5. Audio					.37***
6. Content					

*$p < .05$, **$p < .01$, ***$p < .005$.

beliefs, attitudes, and behavioral intentions that are important determinants of drug use behaviors (Fishbein, Hall-Jamieson, Zimmer, von Haeften, & Nabi, 2002). It is also found to be a good proxy measure of actual ad effectiveness (Biener, 2002; Biener & Taylor, 2002). Perceived ad effectiveness was measured with four items on a 5-point scale (1 = strongly disagree, 5 = strongly agree): "This ad was convincing," "The ad said something important to me," "Watching this ad helped me feel confident about how to best deal with using marijuana," and "If my friends were offered marijuana, this ad would help keep them from using marijuana." The mean of these four items was used to indicate the perceived antidrug effectiveness of each ad ($M = 3.36$, $SD = 0.23$, Cronbach's $\alpha = .79$).[2] Ad liking was measured with a single 7-point item "do you like or dislike the ad" ($M = 4.88$, $SD = 0.45$). Thoughts about each ad were generated following the conventional thought listing procedure (Petty & Cacioppo, 1986). Adolescents were asked to report as many as four thoughts per ad after viewing it. The number of positive and negative thoughts were coded (kappa $\geq .80$). The number of negative thoughts was subtracted from the number of positive thoughts to get a score for the dominant thought valence ($M = 24.02$, $SD = 13.79$).[3] These three indicators of ad effectiveness were positively correlated. The intercorrelations among three variables were .71 between perceived ad effectiveness and thought valence, .78 between perceived ad effectiveness and ad liking, and .82 between ad liking and thought valence.[4]

Analytic Strategy

The interaction between MSV and argument quality was tested with analysis of variance following a three-step procedure. First, MSV total was tested as a moderator for the effects of argument quality on three effectiveness measures. This was done to see which theoretical model best accounted for the attentional mechanism of MSV (H1 and H2). Second, MSV total was decomposed to four subcomponents (Audio, Visual, Content, and Intense Image) and each subcomponent was tested as a moderator for argument quality on three effectiveness measures. This was to see which component of MSV drove the overall interaction effect (RQ1). The Format subscale (in contrast to the Content subscale) was also tested as a potential moderator variable. Third, the 3-way interaction between MSV, argument quality, and risk of marijuana use was tested to see whether the interaction between MSV and argument quality was more evident among high risk adolescents. This test served as a further check of the construct validity of MSV (H3).

Results

A two (strong vs. weak argument) by two (high vs. low MSV) nonexperimental design was employed in the current study. The ads were put into strong versus weak argument and the high versus low MSV condition based on median splits on the corresponding variable. An example of the ads in each condition is described in detail in the Appendix. The means and standard deviations of MSV and argument quality for ads in each condition are presented in Table 2. Strong arguments were evaluated

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Table 2 Means of MSV and Argument Quality by Ad Condition

Ad condition	MSV	Argument quality	*N*
Low MSV weak argument	3.36_a (1.34)	3.60_a (0.10)	14
Low MSV strong argument	3.73_a (1.10)	3.79_b (0.08)	15
High MSV weak argument	7.56_b (2.16)	3.60_a (0.13)	16
High MSV strong argument	7.60_b (1.45)	3.81_b (0.13)	15

Note: Values in parentheses are standard deviations. Values in the same column that do not share the same subscript differ at $p < .001$.

as significantly stronger than weak arguments for both low MSV condition, $t(27) = 5.73$, $p < .001$, partial $\eta^2 = .55$, and high MSV condition, $t(29) = 4.60$, $p < .001$, partial $\eta^2 = .42$. High MSV ads also received significantly higher MSV scores than low MSV ads, both for ads with weak arguments, $t(28) = 6.30$, $p < .001$, partial $\eta^2 = .59$, and ads with strong arguments, $t(28) = 8.21$, $p < .001$, partial $\eta^2 = .71$.

Interaction between MSV Total and Argument Quality

The interaction between MSV total score and argument quality was significant for thought valence, $F(1, 56) = 7.00$, $p = .01$, partial $\eta^2 = .11$, but only approached significance for perceived ad effectiveness, $F(1, 56) = 2.90$, $p = .09$, partial $\eta^2 = .05$, and for ad liking, $F(1, 56) = 3.94$, $p = .06$, partial $\eta^2 = .06$. All three interactions had the same pattern. For low MSV ads, as argument quality increased so did ad effectiveness evaluation; for high MSV ads, increasing argument quality was linked to slightly decreased ad effectiveness evaluation. Ads with low MSV and low argument quality were the least effective. The other three conditions were similar in ad effectiveness (see the top panel in Table 4 for details). This interaction pattern was consistent with H2 and inconsistent with H1. Figure 1 shows the interaction.

Interaction between Subcomponents of MSV and Argument Quality

The interaction between each of the four subcomponents of MSV (Content, Visual, Audio, and Intense Images) and argument quality was tested separately. The interaction between argument quality and the subscale of MSV Format features was also tested. Given the high correlation between MSV total, the Format, and the Visual subcomponents, it was expected that the interaction between MSV total and argument quality was mainly driven by the Format component and by the Visual features within the Format component. Indeed, the interaction between argument quality and the Format component, as well as that between argument quality and the Visual features, was significant or marginally significant for at least two of the dependent measures. Moreover, the Intense Image subcomponent interacted with argument quality on all three dependent measures of ad effectiveness.[5] Table 3 presents the model statistics for the interaction between argument quality and MSV components on evaluations of message effectiveness. No significant main or interaction was found for the Content and the Audio components of MSV on any

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Table 3 General Linear Model for Message Effectiveness by Interaction between Argument Quality (AQ) and MSV Components

Source	Ad effectiveness	$F(3, 54)$	Partial η^2	p-value
Format × AQ	Perceived ad effectiveness	7.61	.12	.01
	Ad liking	5.15	.08	.03
	Thought valence	8.31	.13	.01
Visual × AQ	Perceived ad effectiveness	2.35	.13	.04
	Ad liking	3.29	.06	.08
	Thought valence	4.04	.07	.05
Intense image × AQ	Perceived ad effectiveness	4.28	.07	.04
	Ad liking	4.00	.07	.05
	Thought valence	6.85	.11	.01

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of the dependent measures, although the Audio component showed trend for a similar interaction pattern.

In general, all three subcomponents of MSV (Format, Visual, and Intense Image) showed similar interaction patterns with argument quality on three ad effectiveness measures. Table 4 compares the means of various components of MSV across three dependent measures.[6] Consistent with the results for MSV total score, argument quality only improved ad effectiveness evaluation in the low format condition (i.e., fewer visual features and intense images). In the high format condition, argument quality even reduced ad effectiveness evaluation, although sometimes only slightly. Thus, in contrast to the "content" variable, the "format" features contributed to the overall interaction between MSV total and argument quality on ad effectiveness. Among the Format features, the visual features and the intense images contributed the most to differences in ad effectiveness.

Risk of Marijuana Use as a Moderator

The three-way interaction between MSV total, argument quality, and risk (all were dichotomized based on median split) was significant for perceived ad effectiveness, $F(1, 119) = 3.87$, $p = .05$, partial $\eta^2 = .03$, approaching significance for ad liking, $F(1, 119) = 3.11$, $p = .08$, partial $\eta^2 = .03$, and was nonsignificant for thought valence, $F(1, 119) = 0.98$, $p = .33$, partial $\eta^2 = .01$. Across three dependent measures, the three-way interaction patterns were similar. Table 5 presents the means for the three-way interaction. Figures 2 and 3 show the three-way interaction.

The high risk group showed a MSV by argument quality interaction similar to that found for the whole sample. The interaction between MSV and argument quality was significant for perceived ad effectiveness, $F(1, 56) = 5.03$, $p < .05$, partial $\eta^2 = .08$, and marginally so for ad liking, $F(1, 56) = 3.39$, $p = .07$, partial $\eta^2 = .06$, and thought valence, $F(1, 56) = 3.78$, $p = .06$, partial $\eta^2 = .06$. The pattern of means was again consistent across all three dependent measures. Argument strength reduced the effectiveness of high MSV ads, but slightly improved effectiveness of low MSV ads. Ads with high MSV and low argument quality were found to be the most effective, and ads with low MSV and low argument quality were the least effective.

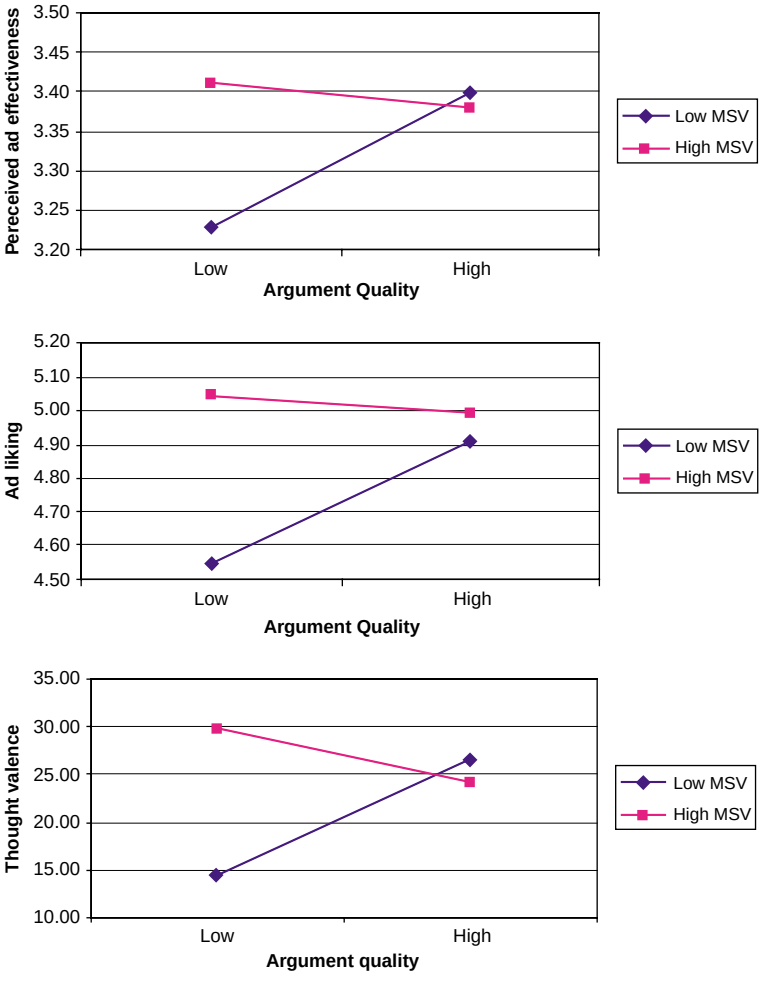

Figure 1 Estimated marginal means of ad effectiveness by MSV and argument quality.

For the low risk group, no interaction effect was found for any of the dependent measures. However, there was a main effect of MSV for ad liking, $F(1, 56) = 6.77$, $p = .01$, partial $\eta^2 = .11$, and marginally so for thought valence, $F(1, 56) = 3.77$, $p = .06$, partial $\eta^2 = .06$. In both high and low MSV conditions, argument quality seemed to improve ad effectiveness, although slightly. The low risk adolescents agreed with the high risk group in considering ads with low MSV and low argument quality as the least effective. However, the low risk group perceived ads with high MSV and high argument quality as equally effective or slightly more effective than ads with high MSV and low argument quality. So the interaction effect found between MSV total and argument quality only held for the high risk adolescents.

As with the two-way interaction, it was expected that the MSV by argument quality interaction for the high risk group was due primarily to the Format subcomponent of MSV. Indeed, the interaction between format and argument

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Table 4 Means of Perceived Ad Effectiveness, Ad Liking, and Thought Valence by MSV (Major Components) and Argument Quality (AQ) Condition

	AQ	Effectiveness	Liking	Thought valence	*N*
MSV total					
Low	Low	3.23_{a} (.27)	4.55_{a} (.49)	14.50_{a} (15.30)	14
High		3.41_{b} (.20)	5.04_{b} (.31)	29.81_{b} (11.19)	16
Low	High	3.40_{ab} (.25)	4.91_{b} (.45)	26.53_{b} (13.59)	15
High		3.38_{ab} (.17)	4.99_{b} (.39)	24.20_{ab} (11.41)	15
MSV format					
Low	Low	3.23_{a} (.27)	4.58_{a} (.51)	15.93_{a} (16.44)	14
High		3.41_{b} (.20)	5.01_{b} (.33)	28.56_{b} (11.44)	16
Low	High	3.46_{b} (.19)	4.99_{b} (.38)	28.93_{b} (11.41)	14
High		3.33_{ab} (.22)	4.92_{ab} (.46)	22.25_{ab} (12.71)	16
Visual					
Low	Low	3.23_{a} (.27)	4.58_{a} (.51)	15.93_{a} (16.44)	14
High		3.41_{b} (.20)	5.01_{b} (.33)	28.56_{b} (11.44)	16
Low	High	3.39_{ab} (.26)	4.93_{ab} (.34)	26.17_{ab} (11.19)	12
High		3.39_{b} (.19)	4.96_{b} (.47)	24.83_{ab} (13.41)	18
Intense image					
Low	Low	3.31_{ab} (.25)	4.76_{a} (.46)	20.64_{ab} (14.65)	25
High		3.39_{ab} (.27)	5.06_{a} (.48)	32.80_{ab} (14.99)	5
Low	High	3.43_{a} (.19)	5.00_{a} (.41)	27.36_{a} (12.09)	25
High		3.18_{b} (.20)	4.69_{a} (.40)	15.40_{b} (9.24)	5

Note: Values in parentheses are standard deviations. Within each panel for each MSV component, values in the same column that do not share subscripts differ at $p < .05$.

quality was significant for perceived ad effectiveness, $F(1, 56) = 10.38$, $p < .005$, partial $\eta^2 = .16$, ad liking, $F(1, 56) = 6.38$, $p < .05$, partial $\eta^2 = .10$, and thought valence, $F(1, 56) = 7.60$, $p = .01$, partial $\eta^2 = .11$, for high risk adolescents. Similar interaction effects were also found for visual features and intense image.[7] For low risk adolescents, borderline main effects of visual features materialized for perceived ad effectiveness, $F(1, 56) = 3.07$, $p = .09$, partial $\eta^2 = .05$, ad liking, $F(1, 56) = 4.68$, $p < .05$, partial $\eta^2 = .08$, and thought valence, $F(1, 56) = 3.29$, $p = .08$, partial $\eta^2 = .06$.

The interaction patterns found among the high risk adolescents were consistent across three subscales of MSV (Visual, Intense Image, and Format) and across three dependent measures. They were also consistent with the overall MSV effect on the whole sample. In sum, the interaction effect between argument quality and MSV format (as well as that between argument quality and certain MSV subcomponents) only holds for the high risk group.[8] Hypothesis 3 is supported.

As a post-hoc analysis, we further compared other features of the high MSV, low argument quality ads ($N = 16$) with those of the high MSV, high argument quality ads ($N = 15$) to find out what content (argument) differences between the two sets of ads may have contributed to this negative slope. All ads were previously rated by adolescents for their perceived emotional impact (making them feel afraid, scared,

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Table 5 Means of Perceived Ad Effectiveness, Ad Liking, and Thought Valence by MSV, Argument Quality (AQ), and Risk of Marijuana Use

MSV	AQ	Effectiveness	Liking	Thought valence	*N*
High risk					
Low	Low	3.25_{a} (.28)	4.63_{a} (.55)	17.71_{a} (17.20)	14
High		3.46_{b} (.19)	5.11_{b} (.33)	31.81_{b} (10.96)	16
Low	High	3.38_{ab} (.26)	4.83_{a} (.44)	23.53_{ab} (13.58)	15
High		3.33_{a} (.17)	4.91_{ab} (.35)	22.07_{a} (10.02)	15
Low risk					
Low	Low	3.31_{a} (.29)	4.70_{a} (.50)	17.17_{a} (15.07)	12
High		3.35_{a} (.16)	4.99_{a} (.29)	27.00_{b} (10.66)	18
Low	High	3.32_{a} (.27)	4.76_{a} (.51)	23.24_{ab} (15.65)	17
High		3.46_{a} (.20)	5.06_{a} (.43)	27.23_{b} (12.95)	13

Note: Values in parentheses are standard deviations. Within each panel (for high and low risk group separately), values in the same column that do not share subscripts differ at $p < .05$.

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sad, sympathetic, alert, and inspired), and coded for the framing style (positive vs. negative frame) and the type of outcome of marijuana use mentioned in the ad (health costs, social costs, self-esteem costs, and positive outcomes) (Yzer, Cappella, Fishbein, Hornik, & Ahern, 2003). Independent sample *t*-tests showed no significant difference between the two sets of ads in terms of emotional appeals and framing. Neither were there differences in terms of mention of health, social, and self-esteem costs. However, ads with high MSV and low argument quality mentioned more of the positive outcomes associated with drug use ($M = 0.07$, $SD = 0.09$) than ads with high MSV and high argument quality ($M = 0.02$, $SD = 0.03$), $t(29) = -2.33$, $p < .05$.

In addition, a careful reading of the arguments extracted from these ads showed that among 15 ads with high MSV and high argument quality (a total of 45 sentences), six arguments (9 sentences) started with "Don't," compared to none in the high MSV and low argument quality condition (16 arguments, 42 sentences). When considering the audio track of the ad (verbal use of "Don't"), this ratio was 5 to 0. The emphasis on commands not to do something may have undermined the high argument quality, high MSV ads compared to the low argument quality, high MSV ads.

Discussion

The primary results from our analyses are presented in Figures 2 and 3—a crossed interaction between MSV and argument quality on ad effectiveness for adolescents at greater risk for marijuana use, and no interaction effect for low risk adolescents. The results are similar across three different measures of ad judgments—perceived ad effectiveness, ad liking, and positive relative to negative thoughts. Several aspects of the observed three-way interaction need interpretive commentary. First, why are the high MSV, strong argument ads judged so ineffective by the high risk adolescents? Second, why are the high risk adolescents so different from the low risk adolescents in

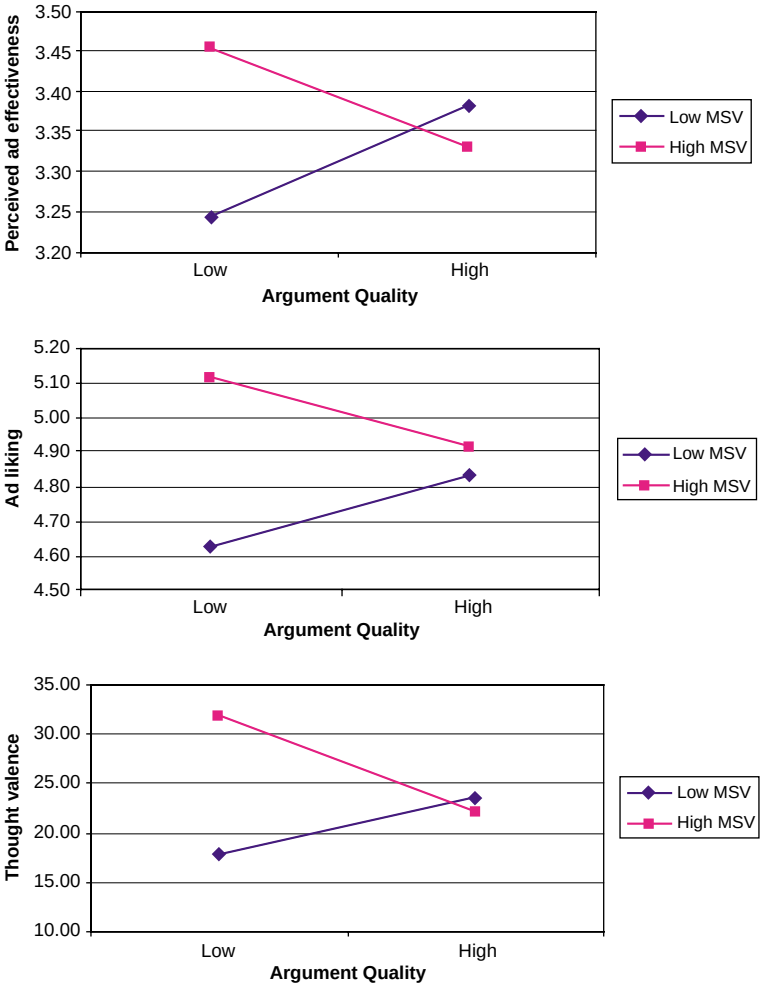

Figure 2 Estimated marginal means of ad effectiveness by MSV and argument quality for the high risk adolescents.

the way they judge the ads? Third, what are the implications of our results for the possible attentional mechanisms of MSV? Fourth, are the findings generalizable? In what ways are they limited? And finally, what are the implications of our findings for decisions about ad design in antidrug campaigns?

Crossed Interaction

For the high MSV ads, the judged effectiveness of the ads did not remain constant from low to high argument strength but actually declined for the high risk audience. The ELM would predict that if the high MSV ads had distracting features for the highly involved adolescents (i.e., those of high risk), then thoughts would be disrupted so that fewer supportive thoughts would be generated. Such a mechanism implies that there would be a flat association between argument strength and ad

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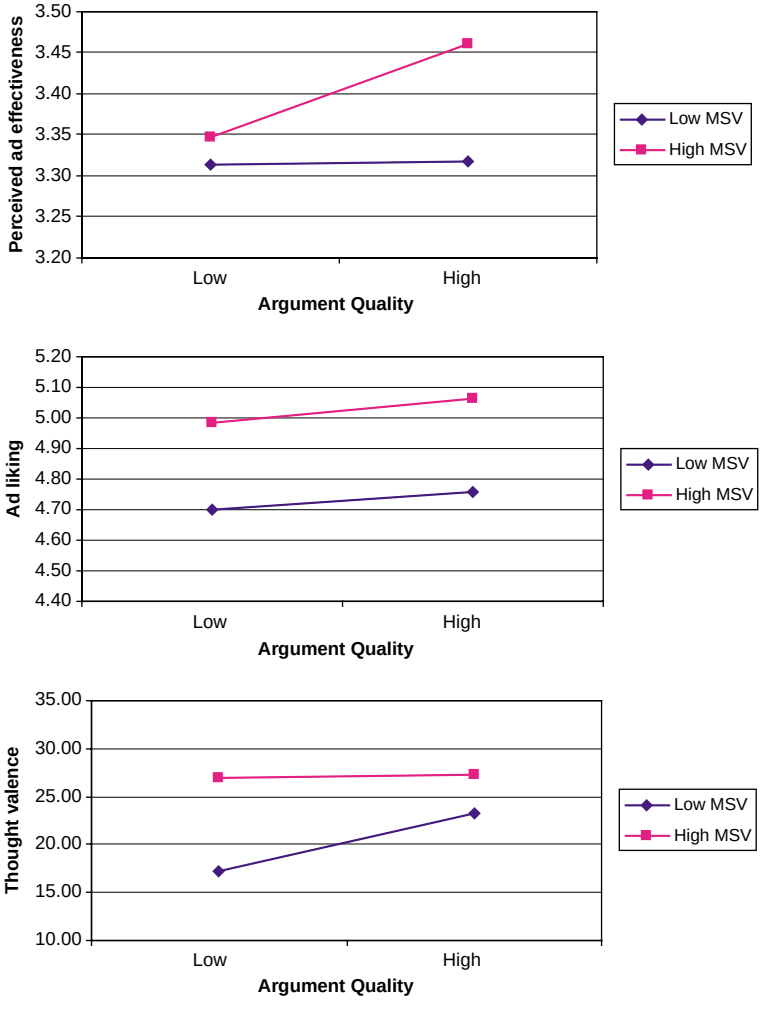

Figure 3 Estimated marginal means of ad effectiveness by MSV and argument quality for the low risk adolescents.

effects, not a negative slope. So while the interaction is not surprising, the crossed nature of the interaction between MSV and argument quality is surprising. For the target audience of at-risk adolescents, the high MSV, high argument quality ads are among the least effective ads for the measures of perceived ad effectiveness (e.g., convincingness) and thought valence.

We offer and explore several possible explanations. The primary explanation is disruption of dominant thoughts as presented in the rationale section of this paper. Some pre-ELM studies (Petty et al., 1976; Regan & Cheng, 1973) indicate that distraction can reduce the audiences' dominant thought patterns during message processing—interfering with supportive thoughts for strong messages and with opposing thoughts for weak messages. If this process was occurring in the current

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study in the high MSV condition, then, there should be fewer supportive thoughts in the high argument quality condition and fewer opposing thoughts in the low argument strength condition. We do have this pattern with thought valence. When the supportive and opposing thoughts are separated, we find further support for this hypothesis.[9]

Although thought disruption can account for the crossover interaction effect observed, the data are not definitive. The finding that low argument quality ads mentioned more of the positive consequences of marijuana use than low argument quality ads in the high MSV condition suggests that by mentioning the positive as well as the negative consequences of marijuana use, the low argument quality ads may function more like two-sided arguments. Therefore, they are perceived as more persuasive than ads with only one-sided messages (high argument quality ads). This is consistent with prior meta-analyses (Allen, 1991). In addition, high argument quality ads more often start their arguments with "Don't" than low argument quality ads. As imperative sentences starting with "Don't" often imply a demand, an order, or a prohibition, this type of sentence may elicit a sense of restricted freedom from the audience. Brehm's (1966) reactance theory suggests that when people perceive their freedom is restricted, a state of psychological reactance will be elicited, which may be reflected in one's disobedience in attitude and behaviors. Psychological reactance is especially common in adolescents, who are beginning to establish their personal autonomy and independence. Thus, the presence of "Don't" in high MSV and high argument quality condition may have reduced adolescents' willingness to listen to the advice and hence have reduced ad effectiveness.

More broadly, a defensive processing may exist not because of the "Don't" sentences, but because of the high involvement of the high risk adolescents with marijuana use. High risk adolescents (in our operational definition) are older and more exposed to opportunities to obtain marijuana than low risk adolescents; they may have more direct knowledge of and a positive attitude toward marijuana use (Yzer et al., 2004). As one's involvement with the topic increases, one may start a biased processing of the message "in the interest of self-protection" or "in the service of one's own ego" (Petty & Cacioppo, 1986, p. 148). For high risk adolescents, the combination of strong arguments and high MSV is more threatening and more difficult to resist. As a result of these pressures and the desire to maintain their independence, they would rate those ads as especially unpleasant. Studies on antimarijuana ads find that adolescents with more favorable predispositions toward and high involvement with marijuana display more negative cognitive processing of antimarijuana arguments than their low risk counterparts (Stephenson & Palmgreen, 2001). High risk adolescents often show no or reverse attitude change after viewing the ads due to defensive processing (Yzer et al., 2003).

In sum, the negative association between argument strength and ad effectiveness in the high MSV condition may be due to one or more possible mechanisms: disruption of dominant thoughts, two-sidedness of the arguments, specific reactance to direct commands, or general reactance in response to high quality format and content. One

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or more of these factors or the factors in combination may be the direct causal reasons, explaining the crossed interaction observed in Figure 2.

High Risk versus Low Risk Adolescents

The high and low risk adolescents behave similarly in their judgments of the ads when the ads have low MSV, but in quite opposite ways when the ads have high MSV. Across three measures of ad effectiveness, high risk adolescents perceive ads with high MSV and strong arguments to be less effective than ads with high MSV and weak arguments. However, low risk adolescents perceive ads with high MSV and strong arguments as slightly more or equally effective as ads with high MSV and weak arguments. While the low risk group exhibits a positive (sometimes small) main effect of MSV and argument strength across all ad effectiveness measures, the high risk group experiences more distraction effect of MSV and hence the interaction between MSV and argument quality. The differences are likely due to three reasons. First, high risk adolescents are more involved with the issue (more positive attitudes toward using, more opportunity, more friends who use) and tend to pay more attention to the message in general. Second, high risk adolescents have a stronger tendency to process defensively when exposed to high quality production ads (high in argument quality and MSV). Third, high risk adolescents are also high sensation seekers, who are more oriented toward high MSV messages. Therefore, they are more likely than their low risk counterparts to be attracted to and hence distracted by those MSV features.

Attentional Mechanism of MSV

High MSV ads can draw an audience's attention toward an ad's audio and video features and away from central content. In our study we have only studied attention to ads in a context where initial attention to the ad is already high because of demands by the experimenter. So our study ignores the utility of high MSV ads to draw an adolescent's attention through the media clutter that makes achieving reasonable levels of ad exposure so difficult for most communication campaigns. However, given initial exposure to the ad, our study speaks directly to the question of whether high MSV ads distract from central content or invite deeper processing of central content.

The results of this study can be understood to support the ELM-based hypothesis that MSV may attract an audience's attention toward the format features of the ads, and reduce the audience's ability to process the central argument of the ads. When viewing low MSV ads, adolescents' cognitive resources are not redirected to ad format features. Hence, they are more able to process the arguments contained in the ads. In this situation, argument quality improves the perceived ad effectiveness, ad liking, and the positive thoughts about the ads. Conversely, high MSV ads may reduce attention to central content, reducing the audience's ability to produce supportive thoughts linked to the high quality arguments. In this situation, strong arguments may not enjoy any advantage over weak arguments.

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Several MSV features are found to be more attraction getting than others in this particular ad context and on this particular population. In our study, the Format subscale carried the interaction effect most clearly. Within the Format subscale, the Visual and Intense Image subscales were the key components affecting ad judgments. These results are consistent with prior studies, which found that these individual components can elicit attention by themselves without being combined with other message features (e.g., Basil, 1994; Hitchon & Thorson, 1995; Thorson & Lang, 1992). While the content component of MSV may be effective in eliciting affective responses, it does not seem to distract attention away from the central argument. This can be explained by the fact that content features (e.g., use of narratives vs. act out) are more closely related to the central message and are harder to separate from the central argument. Thus processing of the content features of MSV may not contribute to the distraction effect for the processing of the central argument.

This suggests that future research should recognize that MSV-as-distraction versus MSV-as-focused attention may depend on how ad format and content are organized. Some ads have visuals whose only (or primary) function is to draw the audience's visual attention to the ad. Other ads have visuals which both draw attention and help to illustrate or convey the central argument of the ad. The former ads might be called ones low in format-content redundancy while the latter are high in format-content redundancy. High MSV ads that are also high in format-content redundancy would not be distracting because, when attention is drawn, for example, to an evocative visual (a high MSV feature) that illustrates the central argument, drawing attention to the visual becomes the same thing as drawing attention to the central argument. So format-content redundancy in ads may be a key to understanding when MSV features are distracting and when they direct attention toward central content.

Generalizability

The study was conducted with a limited set of ads ($N = 60$). The sample producing these effects cannot be considered a random nor a representative sample. Both of these factors will limit generalizability of the findings. Nevertheless the number of ads per condition was at least 15 and the mean estimates used in the analysis came from a diverse sample of adolescents in terms of age, race, gender, and socioeconomic status (as indicated by mother's education).

The study also does not test the actual effects of ads on behavioral intention or behavior. Instead judgments of ad effectiveness are employed as surrogate measures of more direct consequences. The surrogates we employed allow us to evaluate many ads simultaneously but run the risk that the three ad judgments employed will be poor indicators of behavioral intention or behavior change. The use of positive and negative thoughts is generally a good indicator of agreement with the message and is widely used among social psychologists and persuasion researchers to indicate message acceptance.

Our study is a secondary data analysis and so we can only hypothesize the underlying causal mechanisms. Subsequent studies will need to focus on process concerns. For example, if MSV is a valid indicator of attention, covert measures of

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attention (e.g., psychophysiological) may help explain the cognitive mechanisms of distraction. The current study is concerned only with antimarijuana PSAs directed at adolescents. Whether the distraction effects observed here with high MSV, high risk groups will also occur with other populations (e.g., adult marijuana users) and other topics (e.g., treatment-seeking PSAs) remains to be seen. The range of MSV scores in our ads was quite broad while the range in argument quality was less so. Other research shows that antimarijuana ads are often evaluated as weakly effective with a narrow range of effectiveness score (Fishbein et al., 2002). Results from our study and Fishbein et al.'s work indicate that antimarijuana arguments are less compelling than those available for other behaviors (e.g., cigarette smoking). In the context of much stronger arguments than are available with marijuana, the distracting effects of MSV may pale.

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Implications for Ad Design and Production

Granting the (potential) robustness of our study's findings, certain implications for message design follow. If messages high in MSV distract high risk audiences from processing central content, then it might very well be undesirable to couple the campaign's strongest arguments in high MSV contexts. Weaker arguments might function very well in high MSV formats because the dominant thoughts (oppositional ones presumably) would be suppressed. Coupling the stronger arguments with the low MSV format would yield messages judged to be effective by both low and high risk audiences. In short, message designers need to know in advance which of their arguments are strongest before embedding the arguments in high or low MSV formats.

A few caveats to this implication should be kept in mind based on post facto data analyses and some speculations about ad processing. When ads have visual format features that are redundant with the central argument, it is possible that high MSV, high argument quality ads may function effectively. This speculation awaits future research. Two-sided messages with refutation are almost a cliché in designing effective messages. Health professionals would not and should not describe the benefits of drug use. Yet, messages that at least give the appearance of balance and avoid (at least for high risk adolescent audiences) the language of commanding and demanding are more likely to be seen as effective by these high risk audiences.

The distraction effect of MSV may be generalized to other attention getting features as well. As a general concern, the attempt by message designers to break through to their audiences by using attention getting devices is a sound campaign strategy. At the same time, the very devices that can gain attention can also distract from the central content of a message that must be processed to achieve stable and lasting belief change in service of lasting behavior change.

Notes

[1] Southwell (2002) argued that "faces on screen" was a good measure of long term ad recognition because it tapped into "personalization" or "acting out," the latter being one characteristic of standard MSV coding. Faces on screen also play a primary role in a new

message feature measure called "Information Introduced," which is shown to affect attention to ads (Lang, Bradley, Park, Shin, & Chung, 2006).

[2] Similar items measuring perceived ad effectiveness have been used in a previous study with high validity and reliability (Fishbein et al., 2002). Although this scale used some overlapping items as the argument quality scale, they were not significantly correlated ($r = .13$, $p = .31$).

[3] Additional information on the procedures followed in obtaining and evaluating the effectiveness measures (including the coding procedure for the thought listing data) can be found in Barrett, Ahern, Cappella, Fishbein, and Yzer (2004; a copy of this paper is available from the second author).

[4] Although prior literature does not generally find a high correlation between ad liking and the other two message effectiveness measures at the individual level, this result shows that ad liking can be highly correlated with perceived message effectiveness and thought listing at the aggregate level.

[5] Although the relatively low correlation between Intense Image subscale and MSV total score did not suggest that the interaction between MSV and argument quality could be carried by Intense Image, this moderate correlation may result from a skewed distribution of Intense Image.

[6] Figures for the interaction between these MSV subcomponents and argument quality on message effectiveness are available from the first author upon request.

[7] Detailed information about the interaction effect between subcomponents of MSV and argument quality for high risk adolescents is available from the first author upon request.

[8] A plausible hypothesis is that high risk adolescents would have more thoughts about ad features in the high MSV condition than low risk adolescents. Thoughts about ad features (e.g., lighting, music, edits, cuts, etc.) and ad content (e.g., ad message and issues brought up in the ad, etc.) were coded separately. Our analyses with MSV, argument quality, and risk as independent variables, and content thoughts or feature thoughts as the dependent measure showed no significant effect of MSV and argument quality. Nor were there significant two- or three-way interactions among the independent measures. There was only a significant main effect for risk on feature thoughts, $F(1, 119) = 5.02$, $p < .03$. On average, high risk adolescents reported more thoughts about ad features ($M = 1.88$, $SD = 2.49$) than low risk adolescents ($M = 1.03$, $SD = 1.35$). This difference is consistent with the assumption that high risk adolescents (who are also high sensation seekers) are more attentive to the ad's features than are low risk adolescents.

[9] There was a significant interaction between MSV and argument quality for positive thoughts, $F(1, 56) = 11.95$, $p = .001$, partial $\eta^2 = .17$. For low MSV ads, strong arguments were associated with more positive thoughts than weak arguments ($M_{strong} = 40.67$, $SD_{strong} = 8.42$ vs. $M_{weak} = 33.57$, $SD_{weak} = 7.02$). However, for high MSV ads, strong arguments were associated with fewer positive thoughts ($M_{strong} = 38.07$, $SD_{strong} = 6.16$ vs. $M_{weak} = 43.38$, $SD_{weak} = 6.30$). The interaction between MSV and argument quality was not significant for negative thoughts. However, the pattern was opposite to that for positive thoughts. Weak arguments were associated with more negative thoughts for low MSV ads ($M_{weak} = 19.00$, $SD_{weak} = 8.59$ vs. $M_{strong} = 13.93$, $SD_{strong} = 7.19$), but fewer negative thoughts for high MSV ads ($M_{weak} = 13.44$, $SD_{weak} = 6.81$ vs. $M_{strong} = 13.73$, $SD_{strong} = 7.25$). Thus, high MSV does seem to disrupt the predominant thought generated by the ads.

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Appendix Examples of PSAs in Each Condition

Ad name	Central argument	Argument quality	Visual images	MSV coding
No date	If you smoke up, no one will want to be around you—you won't even be able to get a date. People who smoke can't see their own problems.	3.38 (low)	A mid-range shot showed two pretty high-school girls fixing their hair in front of a bathroom mirror and discussing why no one asked them to the prom. They said they did not get it while lighting up and smoking a marijuana cigarette.	2 (low)
True lies	You may not be an addict living on the streets but you can still get hung up on marijuana. It can damage your lungs and lower your attention to school and to friends. Don't ignore the warnings about marijuana.	3.89 (high)	A close-up shot of a TV screen showing an old man talking about negative consequences of using marijuana. The camera then focused on one girl, who turned off the TV. She started to prepare the marijuana cigarette, while saying she did not believe that people still tried to persuade them not to use weed. The other girls disagreed with her and listed some negative consequences of marijuana. The camera moved to each girl when they talked. The girl finally said she was in the wrong place and left the room. A mid-range shot showing the other girls shrugging and shaking heads.	4 (low)
I am free	Kids who are drug free do fun things like sports and jumping out of an airplane. Lots of kids are drug free and doing cool things.	3.38 (low)	Many cuts, with each shot showing one sport (e.g., bicycling, running, skiing, hockey, basketball, volleyball, etc.). Loud and exciting music with the lyrics: "I am free. I am waiting you to follow me." Various colors (e.g., blue, purple, red) were applied to the shots showing special visual effects. Random faces and words of "I'm" and "free" flashed constantly on the screen. The ad ended with a screen that read "live drug free."	9 (high)

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Appendix (*Continued*)

Ad name	Central argument	Argument quality	Visual images	MSV coding
Gymnast	The feeling you get from achieving your goals is much better than getting high. Sports can give you the best kind of high, a natural high.	3.89 (high)	The ad started with furtive music and black-and-white slow-motion shots showing hallucinated views of the ceiling and a girl's face, while the voiceover said: "Last night Lisa Watson got higher than she has ever been." Then the shots became colorful and showing a gymnast's moves in the air in slow motion, while the voiceover said "and the only thing she took . . .". The screen finished with the gymnast's solid landing on the ground and a happy smile on her face. Happy music arises with applauding, as the voiceover continued "was the first place."	9 (high)